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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,725	10/14/2003	Tommie W. Kelley	59045US002	5402

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EXAMINER	
CHUO, TONY SHENG HSIANG	

ART UNIT	PAPER NUMBER
1746	

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

11

Office Action Summary	**Application No.** 10/685,725	**Applicant(s)** KELLEY ET AL.	
	Examiner Tony Chuo	**Art Unit** 1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13 and 15-39* is/are pending in the application.
  4a) Of the above claim(s) *14 and 40-42* is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-13 and 15-39* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  a)☐ All b)☐ Some * c)☐ None of:
    1.☐ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/19/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-13 and 15-39, drawn to method of making a thin film battery, classified in class 29, subclass 623.5.

II. Claims 14, 40, and 41, drawn to thin film battery, classified in class 429, subclass 162.

III. Claim 42, drawn to a mask set, classified in class 118, subclass 504.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the product as claimed can be made by another and materially different process.

Inventions I and III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different designs, modes of operation, and effects (MPEP § 802.01 and § 806.06). In the instant case, the different inventions are the method of making the thin film battery and the mask set.

Inventions II and III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different designs, modes of operation, and effects (MPEP § 802.01 and § 806.06). In the instant case, the different inventions are the thin film battery and the mask set.

Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are independent or distinct for the reasons given above and the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. Kent Kokko on 3/2/06 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-13 and 15-39. Affirmation of this election must be made by applicant in replying to this Office action. Claims 14 and 40-42 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 39 recites the limitation "current collect of battery shared with source, drain or gate electrode of integrated circuit". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-4, 9-13, 15-19, 24, 26, 27, 29, 32, 33, 35, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 2002/0110733) in view of Walters (US 4952420). The Johnson reference teaches a method of preparing a thin film battery comprising steps of a) providing a substrate, b) aligning substrate with current collector mask, c) depositing a current collector layer onto the substrate, d) depositing a cathode layer e) aligning the substrate with electrolyte mask, f) depositing an electrolyte layer, g) aligning the substrate with anode mask, h) depositing an anode layer, and i) depositing a protective layer over the completed thin film battery (See claims 14 and 18). It also teaches cell that are connected in series with a shared current collector so that the anode and cathode current collectors are deposited concurrently (See paragraph [0027]). It also teaches a substrate layer selected from flexible polymeric substrates, silicon substrates, and silica substrates (See paragraph [0023]). It also teaches positioning the aperture mask in proximity to substrate. It also teaches that each of the depositing steps are vapor depositing steps (See claim 19). It also teaches repeating the steps b) through h) until the desired number of battery cells has been deposited to produce a multicell stacked column of thin film batteries (See claim 15). It also teaches connecting the cells in series or in parallel (See paragraphs [0025] and [0027]). It also teaches a planar array of thin film batteries produced on the substrate (See Figure 14). It also teaches vapor depositing steps selected from sputtering, chemical vapor deposition, metalorganic chemical vapor deposition,

combustion chemical vapor deposition, plasma enhanced chemical vapor deposition, and electron beam evaporation deposition (See claim 19). It also teaches a first web of flexible substrate film, an aligning drum system that moves the first web relative to the second web and a deposition station that deposits onto the substrate through the deposition mask pattern defined by the polymeric aperture mask (See paragraph [0032] and [0034]). It also teaches an aligning drum system that aligns the deposition mask pattern with the substrate prior to deposition by stretching the substrate film (See paragraph [0034]). It also teaches positioning a different area of the substrate and deposition mask pattern of second aperture mask in proximity to each other and depositing a cathode layer on the different area of the substrate film through the second deposition mask pattern (See Figure 4 and paragraph [0034]). It also teaches sequentially positioning the substrate in proximity to each of a number of aperture masks formed with deposition mask patterns and sequentially depositing the anode, electrolyte, and cathode layers on the substrate through the deposition mask pattern to create a thin film battery (See paragraph [0034]). However, it does not expressly teach a flexible, repositionable polymeric shadow mask. The Walters reference does teach a flexible, repositionable polymer film mask for a vapor deposition patterning method (See column 4, lines 10-12 and column 6, lines 25-26). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Johnson method of producing a thin film battery to include a flexible, repositionable polymeric mask because polymer films are easily manufactured and more cost effective.

6. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 2002/0110733) in view of Walters (US 4952420) as applied to claims 1-4, 9-13, 15-19, 24, 26, 27, 29, 32, 33, 35, and 36 and in further view of Johnson (US 6402796). However, the references do not expressly teach a cathode that is a lithium transition metal oxide selected from amorphous V_2O_5, crystalline TiS_2, $LiMn_2O_2$, $LiCo_{0.2}Ni_{0.8}O_2$, $LiCoO_2$, LiV_3O_8, LiV_2O_5, LiV_3O_{13}, $LiMnO_2$, $LiMnO_4$, V_2O_5, and $Li_xMn_{2-y}O_4$, an electrolyte that is lithium phosphorus oxynitride, and an anode layer selected from lithium metal, lithium intercalation compounds, silicon tin oxynitride, tin, tin/lead alloys and gold. The Johnson reference does teach a cathode that is a lithium transition metal oxide selected from V_2O_5, $LiCoO_2$, and $LiMnO_2$, an electrolyte that is lithium phosphorus oxynitride, and an anode layer selected from lithium metal, lithium intercalation compounds, silicon tin oxynitride, and tin. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Johnson method of producing a thin film battery to include a cathode that is a lithium transition metal oxide selected from V_2O_5, $LiCoO_2$, and $LiMnO_2$, an electrolyte that is lithium phosphorus oxynitride, and an anode layer selected from lithium metal, lithium intercalation compounds, silicon tin oxynitride, and tin because these materials are well known in the art of producing thin film lithium batteries.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 2002/0110733) in view of Walters (US 4952420) as applied to claims 1-4, 9-13, 15-19, 24, 26, 27, 29, 32, 33, 35, and 36. However, the references do not expressly teach an aperture mask comprising an elongated web of flexible film. However, it would have

been obvious to one of ordinary skill in the art at the time the invention was made to modify the Johnson method of producing a thin film battery to include an aperture mask that is an elongated web of flexible film because changes in size of an article were held to be obvious (In re Rose 105 USPQ 237 (CCPA 1955)).

8. Claims 21-23, 30-31, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 2002/0110733) in view of Walters (US 4952420) as applied to claims 1-4, 9-13, 15-19, 24, 26, 27, 29, 32, 33, 35, and 36 and in further view of Lake et al (US 5350645). However, the references do not expressly teach an aperture mask that is formed with a number of deposition mask patterns that are substantially the same or two or more different mask patterns. The Lake reference does teach a number of deposition mask patterns that are either the same or two or more different mask patterns (See Figures 6A, 6B, and 6C). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Johnson method of producing a thin film battery to include deposition mask patterns that are the same or different depending on whether the mask is for the anode, cathode or electrolyte layers so that different layers can be deposited through the same web of flexible film mask.

9. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 2002/0110733) in view of Walters (US 4952420) as applied to claims 1-4, 9-13, 15-19, 24, 26, 27, 29, 32, 33, 35, and 36 and in further view of Moulton et al (US 5612153). However, the references do not expressly teach a polymeric mask that comprises a polymer selected from polyimide, polyester, polystyrene, polymethyl methacrylate, and

polycarbonate. The Moulton reference does teach a polymeric mask that comprises a thermoplastic such as polyester and polystyrene (See column 7, lines 61-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Johnson method of producing a thin film battery to include a polymeric mask that comprises polyester or polystyrene because these thermoplastics are easy to manufacture and cost effective.

10. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 2002/0110733) in view of Walters (US 4952420) as applied to claims 1-4, 9-13, 15-19, 24, 26, 27, 29, 32, 33, 35, and 36. However, the references do not expressly teach an alignment mechanism that stretches the polymeric aperture mask to align the deposition mask pattern relative to the substrate. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Johnson method of producing a thin film battery to include a second aligning drum system for stretching the mask because duplication of parts was held to have been obvious (In re Harza 124 USPQ 378 (CCPA 1960)).

11. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 2002/0110733) in view of Walters (US 4952420) as applied to claims 1-4, 9-13, 15-19, 24, 26, 27, 29, 32, 33, 35, and 36. In addition, the Johnson reference teaches a first and second deposition chamber (See Figure 4). However, the references do not expressly teach an aperture mask comprising a third web of film where the third web of film is formed with a number of deposition mask patterns. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify

the Johnson method of producing a thin film battery to include a third web of film mask because duplication of parts was held to have been obvious (In re Harza 124 USPQ 378 (CCPA 1960)).

12. Claims 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 2002/0110733) in view of Walters (US 4952420) as applied to claims 1-4, 9-13, 15-19, 24, 26, 27, 29, 32, 33, 35, and 36 and in further view of Jenson (WO 01/73883). However, the references do not expressly teach depositing one or more layers of an integrated circuit where the current collector of the battery is shared with the source electrode of the integrated circuit. The Jenson reference does teach depositing one or more layers of an integrated circuit where the current collector of the battery is shared with the source electrode of the integrated circuit (See page 3, lines 12-13). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Johnson method of producing a thin film battery to deposit one or more layers of an integrated circuit where the cathode layer and the anode layer of the battery are shared with the integrated circuit in order to simplify the method of manufacturing a thin film battery and integrated circuit.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

3/6/06

MICHAEL BARR
SUPERVISORY PATENT EXAMINER